File name = readme.rtf

U.S. GEOLOGICAL SURVEY DIGITAL DATA SERIES DDS-36

Tabular Data, Text, and Graphical Images in Support of the 1995 National Assessment of United States Oil and Gas Resources

Compiled by
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SYSTEM REQUIREMENTS

The data and text on this CD-ROM require either a (1) Macintosh running System 7 or later and having a 13-inch color monitor and CD-ROM drive or a (2) PC running DOS 5.0 or later and having a VGA color monitor and CD-ROM drive. The Macintosh should have at least 8 megabytes of RAM. The PC system should have at least 4 megabytes of RAM and a 386 processor or better. The map and image viewing programs contained on this CD-ROM are PC-based only. Instructions for obtaining shareware Macintosh-based viewing programs are included in the documentation for DDS-36.

INSTRUCTIONS AND DOCUMENTATION FOR DDS-36

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INTRODUCTION

This CD-ROM releases digital tabular data and text used in the "1995 National Assessment of United States Oil and Gas Resources -- Results, Methodology, and Supporting Data," U.S. Geological Survey Digital Data Series DDS-30 (Gautier and others, 1995) in such a way that the tables and text may be printed by computer users from their own systems. Because of the number and variety of database and word processing programs available, we have provided the data in a raw form, both tab-delimited and fixed-format ASCII for the tables and in both formatted text (ASCII) and rich text format (RTF) for the text. Formatted text can be printed directly from many computer operating systems, such as UNIX, VMS, Macintosh, and Microsoft DOS (MS-DOS); however, the rich text format, which retains the original fonts and text attributes, must be imported into the user's word-processing program. Not included in this CD-ROM are the play-level statistical graphs, although the data for constructing the histograms are included. Also not included are the data for the index maps or the exploration maps. The data for the exploration maps can be found on DDS-35 (Beeman and others, 1996).

Macintosh users will note that box-shaped characters show up at the beginning of lines of data when viewed by some applications such as TeachText. These are linefeed characters needed by DOS users. These characters are ignored by many applications, such as Microsoft Excel, but if you wish to delete them, use a text editor or word processor to delete "control-j" characters.

The data and geologic texts released on this CD-ROM are nonproprietary. Certain data, reservoir information, and geologic descriptions have not been included either on this CD-ROM or on DDS-30 because they are considered proprietary by the database vendors, NRG Associates, Inc., and Petroleum Information Corporation, or other third-party entities such as the Energy Information Administration. Proprietary data may not be released to the public.

This file ("Instructions and Documentation for DDS-36," having file name readme.ans or readme.rtf) also contains four appendixes: Appendix A lists region and province numbers and names. Appendix B is a cross reference of titles from DDS-30 to the files located in the "chapters" subdirectory of this CD-ROM. Appendix C is the directory tree structure used in this CD-ROM. Appendix D is a list in outline form of all reports included in DDS-30 and their authors.

VIEWER PROGRAMS

Two viewer programs are included in this CD-ROM and run only in MS-DOS. They are (1) hydvu20.exe, which is a special program for viewing the gas hydrate maps, and (2) cshow.exe, which can be used to view the JPEG images on this CD-ROM. The program hydvu20.exe, which should be run from the "hydrates" subdirectory, was developed for this report for quick viewing of the hydrates maps stored as ASCII files. The program cshow.exe is a shareware image-display program (CompuShow) developed by Bob Berry of Canyon State Systems and Software. Located in the root directory is cshowa.exe, a self-extracting archive of the program cshow.exe, supporting drivers, and documentation. Users must run the cshowa.exe program to install cshow.exe and supporting files to their hard drives. When running cshowa.exe, users will be asked where to install cshow.exe. The program will then self-extract cshow.exe and the supporting files to the location specified. After installation, cshow.exe can be used to view the JPEG images on this CD-ROM. The documentation describes the specific shareware guidelines concerning the use of cshow.exe .

Some of the illustrations of DDS-30 have been converted to JPEG images for more rapid viewing by the user. JPEG images are included for the chapter figures and for the stratigraphic charts for each province (pr#st.jpg). Adobe Illustrator versions of most of these images are also available in files having an .ai extension.

Copyright restrictions limit the selection of viewers on DDS-36. Other viewers that support the JPEG format are available from many anonymous FTP sites for MS-DOS, UNIX, Macintosh, and Windows operating systems; such viewers include lview (Windows) and jpegview (Macintosh). Anonymous FTP sites to investigate for viewers include ftp.ncsa.uiuc.edu and greenwood.cr.usgs.gov. Users can FTP to these locations, and, with the user name "anonymous" and a password such as "guest" or the user's e-mail address, obtain viewers as well as a wide variety of publically available shareware programs and utilities. JPEG images can be viewed, printed, and reformatted to PICT images through the use of some of the newer JPEG viewers available through anonymous FTP sites. The PICT images can be imported into graphic applications such as Superpaint. Two web sites that may also be useful places to check for viewers are SimTel:

http://www.acs.oakland.edu/oak/oak.html

and Jumbo:

http://www.jumbo.com

OVERVIEW OF THE CD-ROM STRUCTURE

The directory structure for this CD-ROM is based upon the structure of the 1995 National oil and gas assessment in DDS-30. There are 8 regions for the assessment,

consisting of 71 provinces. (Province 30 was merged with province 28; province 30 was dropped. Province 5, Klamath - Sierra Nevada, was not assessed. Province 15, San Diego - Oceanside, is not included; it will be assessed by the U.S. Minerals Management Service.) The directory structure (appendix C) consists of 14 main directories: "aggregat," "chapters," "play," "programs," "province," "region1," "region2," "region3," "region4," "region5," "region6," "region7," "region8," and "unconven."

The "aggregat" directory includes tabular data for province- and region-level aggregations of conventional undiscovered resources. The directory called "chapters" contains assessment information that is not specific to a particular region. This information includes printable files such as the "Executive Summary of Results;" specific reports relating to topics such as methodology, GIS, and coalbed methane; and associated JPEG and Adobe Illustrator images of figures, maps, and tables. The "play" and "province" directories provide tabular compilations of the official play and province names, respectively. The "programs" directory includes selected programs that were used in the assessment, as well as their documentation. Each regional directory contains text and tabular data files pertaining to that region as well as a separate subdirectory for each province within that region ("prov#" where # is the province number assigned for the assessment). The subdirectory for a particular province contains files of the descriptive text and stratigraphic columns for all of the plays assessed within that province. The "unconven" directory includes tabular data files for coalbed-gas and continuous-type hydrocarbon deposits.

The root directory of DDS-36 also includes ten files. Both formatted text (readme.ans) and rich-text format (readme.rtf) versions of this readme file are included. The plain text file dds30.err is a compilation of errata for U.S. Geological Survey Digital Data Series DDS-30 (Gautier and others, 1995). The large file regprov.ai is a copy of the 40-inch by 28-inch region and province index map for the lower 48 States (Dolton and others, 1996) in Adobe Illustrator format. A JPEG version of the index map is included as regprov.jpg, and a version in HPGL2 graphics file format is included as regprov.hp. The file cshowa.exe is a self-extracting archive of the program cshow.exe, as discussed in the section of this document concerning viewer programs. The file permissn.jpg is a JPEG image of a letter from Bob Berry of Canyon State Systems and Software granting permission to distribute the CompuShow viewer (cshow.exe). Two text files are extracts from this readme file: authors.ans is a copy of the title block, and disclaim.ans is a copy of the disclaimer.

DATA OVERVIEW

TEXT DATA

Chapters

The "chapters" directory contains files of documents supporting the assessment in both formatted text (.ans extension) and rich text format (.rtf extension). Complex tables and charts were not included in certain formatted text (.ans) versions due to formatting problems (execsum.ans, coalgas.ans, probmeth.ans, gasres.ans, heavyoil.ans, hydrate.ans, and conttype.ans). However, the rich text versions (.rtf) of the reports contain all the original tables included in DDS-30. The figures and tables used in the chapters were converted into JPEG images (files having a .jpg extension) and are available in the "chapters" directory and the "execsum" and "hydrates" subdirectories. Most of these images are also available in Adobe Illustrator versions (files having an .ai extension). Some of the tables were separated by regions due to the size of the image (for example, "Executive Summary" table 2, which was separated into table2a, table2b, table2c, and table2d). The MS-DOS JPEG viewer (cshow.exe) included with this CD-ROM can be used to view the JPEG versions of the figures and tables.

Gas Hydrates Data

Text files for the gas hydrates chapter (hydrate.rtf and hydrate.ans) are located in the "hydrates" subdirectory (below the directory "chapters"). Many of the figures or plates referenced in the hydrates chapter are included as JPEG (hydrfg#.jpg or hydrpl#.jpg) images and Adobe Illustrator files (hydrfg#.ai or hydrpl#.ai). Files of map data are also included in the "hydrates" subdirectory and can be displayed using the MS-DOS program hydvu20.exe (/chapters/hydrates/hydvu20.exe). This program must be run from the "hydrates" subdirectory. The first four characters of the name of each file of line data (having an .lin extension) correspond to the area of study: alsk - Alaska offshore, akon - Alaska onshore, atmx - Atlantic Ocean and Gulf of Mexico, and paco - Pacific Ocean. For each offshore area, there are eight line data files with a three-digit code which succeeds the area code on the file name. These code definitions are as follows: bat - bathymetry, eez - bounding polygon for the area, gtg - geothermal gradient, hys - gas hydrate stability, ply - gas hydrate play boundary, sbt - seabed temperature, sed - sediment thickness, and toc - total organic carbon. The Alaska onshore play includes only gas hydrate stability data and the gas hydrate play boundaries.

For gas hydrates, mylar base maps were compiled from maps ranging in scale from approximately 1:100,000 to 1:20,000,000. With the exception of the gas hydrate plays and the EEZ boundaries, the digital conversion of the data began with scanning the base maps. Editing and reprojecting all the maps into Albers Equal Area projection was done using ARC/INFO. The EEZ boundary used is the combination of a 3-mile offshore limit calculated from State coastline data compiled by the U.S. Geological Survey at a scale of 1:100,000, and a scanned base map of the EEZ boundary (compiled at the U.S. Geological Survey at a scale of 1:20,000,000). Gas hydrate plays were defined by overlaying total organic carbon (TOC) maps (TOC values of 0.5 or greater) with the gas hydrate stability contour lines and the EEZ boundary.

These gas hydrate coverages were converted into ASCII files that consist of x,y coordinates for every vertex and a header for every line segment. The header represents isolines having measurement units appropriate to the data type: bathymetry in meters, sediment thickness in meters, seabed temperature in degrees Celsius, geothermal gradient in degrees Celsius per 100 meters, and organic carbon in percent. Gas hydrate stability is given as the thickness of the hydrate stability field in meters. For files ending with toc.lin, sed.lin, and sbt.lin, the header values were fractional, and since ARC/INFO line headers are necessarily integers, the headers must be divided by ten to restore their actual values. The header values for files ending with eez.lin and ply.lin are not for isolines but for line segments making up bounding polygons.

Regional Descriptions

Each regional directory contains the regional report in both formatted text (.ans extension) and rich text (.rtf extension) formats. The regional reports use the file-naming convention of reg#.ans and reg#.rtf, where # is the region number. The formatted text versions (.ans extension) of the reports can be read and printed from many operating systems. The rich text versions (.rtf) of the reports can be imported into word processing programs such as Word Perfect and Microsoft Word for Windows and Microsoft Word for Macintosh.

Province Descriptions

Each province directory contains files of the text of the province report, including play descriptions, in both formatted text (.ans extension) and rich text format (.rtf extension). The province reports use the file-naming convention of prov#.ans and prov#.rtf, where # is the province number. The formatted text versions (.ans extension) of the reports can be read and printed from many operating systems. Complex tables and charts were removed from certain formatted text versions (.ans) due to formatting problems (prov03.ans, prov27.ans, and prov31.ans). However, the rich text versions (.rtf) of all the reports contain all the original tables included in DDS-30. The rich text versions of the reports (.rtf extension) can be imported into most word processing software packages, such as Microsoft Word for Macintosh and Windows. Not included are the province index maps or the play-level statistical graphs.

Stratigraphic Columns

Each province directory contains files of JPEG images (.jpg extension) and Adobe Illustrator (Macintosh version 5.5) images (.ai extension) of stratigraphic columns. The file-naming convention for the stratigraphic columns is pr#st.jpg and pr#st.ai, where # is the province number associated with the specific stratigraphic column. Some of the larger stratigraphic columns were divided into multiple images indicated by an

additional letter in the file name. The MS-DOS JPEG viewer (cshow.exe) furnished with this CD-ROM can be used to view the JPEG images of the stratigraphic columns. The Adobe Illustrator versions (Macintosh version 5.5) of the stratigraphic columns (.ai) can be imported into both Macintosh and Microsoft Windows versions of Adobe Illustrator.

TABULAR DATA
Data for Conventional Plays

These files contain the data for the conventional plays from the 1995 National Assessment. Only accumulations greater than or equal to 1 million barrels of oil or 6 billion cubic feet of gas are included in this part of the assessment. The data for smaller accumulations are included in the directory "aggregat" in files smfld.tab or smfld.ffa. Two versions of each file are given: tab-delimited ASCII (having a .tab extension) and fixed-format ASCII (having an .ffa extension). In the generic file names given in this readme file, "#" stands for a number -- either region, province, or play -- as appropriate for each type of file. For the fixed-format ASCII files (.ffa extension), the positions within the character string for each variable is given, for example "(characters 1-6)." See the chapter by Gautier and Dolton (method.ans or method.rtf) for further discussion of the data in these files.

conv#in.tab (tab-delimited ASCII) or **conv#in.ffa** (fixed-format ASCII):
Input data for assessment of conventional undiscovered accumulations

These eight files, one for each region, contain the input for the assessment of conventional plays. Only accumulations greater than or equal to 1 million barrels of oil or 6 billion cubic feet of gas are included in this part of the assessment. Following 2 lines of header information, the data are presented in 58 columns:
(1) region -- (characters 1-6) the region number
(2) province_num -- (characters 8-19) the province number
(3) province_name -- (characters 21-62) the province name
(4) play_num -- (characters 64-71) the play number
(5) play_name -- (characters 73-199) the play name
(6) geologists -- (characters 201-231) the geologist(s) responsible for this play
(7) hypo_or_conf -- (characters 233-244) whether the play is hypothetical or confirmed
(8) charge -- (characters 246-251) the probability of adequate hydrocarbon charge
(9) reservoir -- (characters 253-261) the probability of adequate hydrocarbon reservoirs
(10) trap -- (characters 263-266) the probability of adequate hydrocarbon traps
(11) play_prob -- (characters 268-276) the play probability (product of charge, reservoir, and trap)
(12) num_oil_disc -- (characters 278-289) the number of discovered oil accumulations in the play greater than or equal to one million barrels in size
(13) num_gas_disc -- (characters 291-302) the number of discovered non-associated gas accumulations in the play greater than or equal to six billion cubic feet in size

(14) oil_depth_min -- (characters 304-316) the minimum expected depth of undiscovered oil accumulations (in feet)
(15) oil_depth_max -- (characters 318-330) the maximum expected depth of undiscovered oil accumulations (in feet)
(16) oil_depth_med -- (characters 332-344) the median expected depth of undiscovered oil accumulations (in feet)
(17) gas_depth_min -- (characters 346-358) the minimum expected depth of undiscovered gas accumulations (in feet)
(18) gas_depth_max -- (characters 360-372) the maximum expected depth of undiscovered gas accumulations (in feet)
(19) gas_depth_med -- (characters 374-386) the median expected depth of undiscovered gas accumulations (in feet)
(20) oil_fraction -- (characters 388-399) the fraction of undiscovered accumulations expected to be oil accumulations
(21) gas_fraction -- (characters 401-412) the fraction of undiscovered accumulations expected to be gas accumulations
(22) biogenic_gas? -- (characters 414-426) whether any biogenic gas is expected (yes or no)
(23) H2S? -- (characters 428-431) whether any hydrogen sulfide is expected (yes or no)
(24) H2S_% -- (characters 433-438) the expected percent of hydrogen sulfide in the gas
(25) GOR -- (characters 440-444) the expected ratio of associated-dissolved gas to oil (in cubic feet of gas per barrel of oil)
(26) NGL/na_gas -- (characters 446-455) the expected ratio of natural gas liquids to non-associated gas (in barrels of liquid per million cubic feet of gas)
(27) NGL/ad_gas -- (characters 457-466) the expected ratio of natural gas liquids to associated-dissolved gas (in barrels of liquid per million cubic feet of gas)
(28) API_min -- (characters 468-474) the minimum expected API gravity of the oil (in degrees)
(29) API_max -- (characters 476-482) the maximum expected API gravity of the oil (in degrees)
(30) API_mea -- (characters 484-490) the mean expected API gravity of the oil (in degrees)
(31) sulfur_in_oil -- (characters 492-504) the expected percent sulfur in the oil
(32) H2S_in_gas -- (characters 506-515) the expected amount of hydrogen sulfide in the gas
(33) H2S_units -- (characters 517-525) the units for H2S_in_gas (percent or ppm)
(34) type_I_org -- (characters 527-536) whether the source rock is expected to contain type I organic matter (yes or no)
(35) type_II_org -- (characters 538-548) whether the source rock is expected to contain type II organic matter (yes or no)
(36) type_III_org -- (characters 550-561) whether the source rock is expected to contain type III organic matter (yes or no)
(37) TOC -- (characters 563-567) the expected total organic carbon (in percent)

(38) Ro_min -- (characters 569-574) the minimum expected thermal maturity of the source rock
(39) Ro_max -- (characters 576-581) the maximum expected thermal maturity of the source rock
(40) Ro_mean -- (characters 583-589) the mean expected thermal maturity of the source rock
(41) T_max -- (characters 591-596) the maximum expected burial temperature (in degrees Celsius)
(42) in_oil_window -- (characters 598-610) the expected percent of source rock in the maturity range of 0.6-1.2
(43) in_gas_window -- (characters 612-624) the expected percent of source rock in the maturity range of 1.2-2.0
(44) overcooked -- (characters 626-635) the expected percent of source rock in the maturity range of greater than 2.0
(45) max_burial_depth -- (characters 637-652) the maximum expected burial depth of the source rock (in feet)
(46) paleo_grad -- (characters 654-663) the inferred paleotemperature gradient (in degrees Fahrenheit per hundred feet)
(47) oil_median_size -- (characters 665-679) the expected median size of the undiscovered oil accumulations (in millions of barrels)
(48) gas_median_size -- (characters 681-695) the expected median size of the undiscovered non-associated gas accumulations (in billions of cubic feet)
(49) oil_largest_at_5% -- (characters 697-713) the estimate such that there is a five percent chance that the largest oil accumulation is greater than this value (in millions of barrels)
(50) gas_largest_at_5% -- (characters 715-731) the estimate such that there is a five percent chance that the largest gas accumulation is greater than this value (in billions of cubic feet)
(51) oil_shape_factor -- (characters 733-748) the shape factor (1 to 7) for the truncated shifted Pareto distribution of undiscovered oil accumulations (See Houghton and others, 1993.)
(52) gas_shape_factor -- (characters 750-765) the shape factor (1 to 7) for the truncated shifted Pareto distribution of undiscovered non-associated gas accumulations (See Houghton and others, 1993.)
(53) oil_min_num -- (characters 767-777) the minimum expected number of undiscovered oil accumulations
(54) gas_min_num -- (characters 779-789) the minimum expected number of undiscovered gas accumulations
(55) oil_med_num -- (characters 791-801) the median expected number of undiscovered oil accumulations
(56) gas_med_num -- (characters 803-813) the median expected number of undiscovered gas accumulations

(57) oil_max_num -- (characters 815-825) the maximum expected number of undiscovered oil accumulations
(58) gas_max_num -- (characters 827-837) the maximum expected number of undiscovered gas accumulations

conv#out.tab (tab-delimited ASCII) or **conv#out.ffa** (fixed-format ASCII):
Mean estimates from assessment of conventional undiscovered accumulations

These eight files, one for each region, contain the mean resource estimates for the conventional plays. Only accumulations greater than or equal to 1 million barrels of oil or 6 billion cubic feet of gas are included in this part of the assessment. Following two lines of header information, the data are presented in ten columns:
(1) play -- (characters 1-4) the play number
(2) num_oil_accums -- (characters 6-19) the mean number of undiscovered oil accumulations
(3) oil_mean_size -- (characters 21-33) the mean size (in millions of barrels) of the undiscovered oil accumulations
(4) oil -- (characters 35-44) the mean estimate (in millions of barrels) of volume of undiscovered oil
(5) assoc_gas -- (characters 46-55) the mean estimate (in billions of cubic feet) of volume of undiscovered associated gas
(6) assoc_gas_liquids -- (characters 57-73) the mean estimate (in millions of barrels) of volume of undiscovered associated gas liquids
(7) num_gas_accums -- (characters 75-88) the mean number of undiscovered non-associated gas accumulations
(8) gas_mean_size -- (characters 90-102) the mean size (in billions of cubic feet) of the undiscovered non-associated gas accumulations
(9) non-assoc_gas -- (characters 104-116) the mean estimate (in billions of cubic feet) of volume of undiscovered non-associated gas
(10) non-assoc_gas_liquids -- (characters 118-138) the mean estimate (in millions of barrels) of volume of undiscovered non-associated gas liquids

correl_#.tab (tab-delimited ASCII) or **correl_#.ffa** (fixed-format ASCII):
Calculated correlations between conventional, assessed plays

These eight files, one for each region, include the output values showing the calculated correlation between conventional, assessed plays. Following two lines of header information, the data are presented in nine columns:
(1) province -- (characters 1-6) the province number
(2) first_play -- (characters 8-17) the number of the first play
(3) second_play -- (characters 19-30) the number of the second play

(4) corr_row_num -- (characters 32-43) the row number of the province correlation matrix
(5) corr_col_num -- (characters 45-57) the column number of the province correlation matrix
(6) adjusted_corr -- (characters 59-74) the adjusted correlation value
(7) original_corr -- (characters 76-89) the original correlation value (average of the original three correlation values in depend#.tab or depend#.ffa)
(8) residual -- (characters 91-102) the value of the residual (adjusted_corr minus original_corr)
(9) bias_factor -- (characters 104-114) the bias factor: Note, if the bias factor is positive, no adjustment is made to the correlation matrix. If the bias factor is negative, a bias factor equal to the absolute value of this quantity plus 0.001 is applied to the matrix of correlations to make it a correlation matrix. The more negative the factor, the more bias needs to be applied.

depend#.tab (tab-delimited ASCII) or **depend#.ffa** (fixed-format ASCII):
Input for calculation of correlations between conventional, assessed plays

These eight files, one for each region, include the input values for determining the correlation between conventional, assessed plays. The first three columns include values of 0.1, 0.5, or 0.9, signifying (respectively) low, moderate, or high correlation on that factor for the pair of plays. Following two lines of header information, the data are presented in seven columns:
(1) charge -- (characters 1-6) value for correlation with respect to charge for the two plays
(2) reservoir -- (characters 8-16) value for correlation with respect to reservoir for the two plays
(3) trap -- (characters 18-21) value for correlation with respect to trap for the two plays
(4) first_play -- (characters 23-29) the number of the first play
(5) first_play_name -- (characters 34-160) the name of the first play
(6) second_play -- (characters 162-168) the number of the second play
(7) second_play_name -- (characters 174-300) the name of the second play

exp#.tab (tab-delimited ASCII) or **exp#.ffa** (fixed-format ASCII):
History of exploration effort by play

These files contain the number of exploratory wells (initial well classification of 4 or 5) from the Well History Control System file (Petroleum Information Corp., 1993 and 1994) associated with a particular play. As such , they give a crude measure of exploration effort in the play by year. The files exists only for selected plays. Unlike much of the other tabular data, these data could not be conveniently grouped into region-level files,

so there is one file per play. Following one line of header information, the data are presented in three columns:
(1) year -- (characters 1-4) year of reported number of exploratory wells
(2) num_exp_wells -- (characters 6-14) number of exploratory wells drilled for the given year
(3) cum_exp_wells -- (characters 16-28) cumulative number of exploratory wells

frac#.tab (tab-delimited ASCII) or **frac#.ffa** (fixed-format ASCII):
Fractile estimates from assessment of conventional undiscovered accumulations

These eight files, one for each region, contain the output fractiles for the conventional plays. Only accumulations greater than or equal to 1 million barrels of oil or 6 billion cubic feet of gas are included in this part of the assessment. Following 2 lines of header information, the data are presented in 13 columns:
(1) play -- (characters 1-5) the play number
(2) commodity -- (characters 7-15) either oil or non-associated gas
(3) to (11) -- F99 (characters 17-26), F95 (characters 28-37), F90 (characters 39-48), F75 (characters 50-59), F50 (characters 61-70), F25 (characters 72-81), F10 (characters 83-92), F5 (characters 94-103), and F1 (characters 105-114), fractiles for the distribution of volume of undiscovered resource; F5 means, for example, that there is a 5 percent chance of greater than the listed amount of resource (in millions of barrels of oil or billions of cubic feet of non-associated gas)
(12) mean -- (characters 116-125) the mean estimate (in millions of barrels of oil or billions of cubic feet of non-associated gas) of volume of undiscovered oil or non-associated gas
(13) standard_deviation -- (characters 127-144) the standard deviation of the distribution of volume of undiscovered oil or non-associated gas (in millions of barrels of oil or billions of cubic feet of non-associated gas)

hist#.tab (tab-delimited ASCII) or **hist#.ffa** (fixed-format ASCII):
Size distribution of discovered accumulations

These eight files, one for each region, present the size distribution of the discovered accumulations equal to or larger than 1 million barrels of oil or 6 billion cubic feet of non-associated gas in size. Inferred reserves are not included in the estimation of size, but rather only cumulative production plus proved reserves. Following 1 line of header information, the data are presented in 18 columns:
(1) play -- (characters 1-4) the play number
(2) commodity -- (characters 11-19) oil or gas resource

(3) disc_seq -- (characters 21-34) the portion of the discovery sequence (for example, the first third or the second half, as calculated by number of accumulations) or the total for that commodity
(4) to (18) bins -- number of accumulations having a known volume of commodity in either million barrels of oil (MMBO) or billion cubic feet of gas (BCFG) within the given interval. Accumulations of sizes that correspond to interval boundaries are put in the higher numbered bin (for example, a 2-MMBO accumulation is counted in bin_2). The intervals are:

bin_1 -- (characters 36-44) 1-2 MMBO or 6-12 BCFG
bin_2 -- (characters 46-54) 2-4 MMBO or 12-24 BCFG
bin_3 -- (characters 56-64) 4-8 MMBO or 24-48 BCFG
bin_4 -- (characters 66-74) 8-16 MMBO or 48-96 BCFG
bin_5 -- (characters 76-84) 16-32 MMBO or 96-192 BCFG
bin_6 -- (characters 86-94) 32-64 MMBO or 192-384 BCFG
bin_7 -- (characters 96-104) 64-128 MMBO or 384-768 BCFG
bin_8 -- (characters 106-114) 128-256 MMBO or 768-1536 BCFG
bin_9 -- (characters 116-124) 256-512 MMBO or 1536-3072 BCFG
bin_10 -- (characters 126-134) 512-1024 MMBO or 3072-6144 BCFG
bin_11 -- (characters 136-144) 1024-2048 MMBO or 6144-12288 BCFG
bin_12 -- (characters 146-154) 2048-4096 MMBO or 12288-24576 BCFG
bin_13 -- (characters 156-164) 4096-8192 MMBO or 24576-49152 BCFG
bin_14 -- (characters 166-174) 8192-16384 MMBO or 49152-98304 BCFG
bin_15 -- (characters 176-184) at least 16384 MMBO or at least 98304 BCFG

sizes#.tab (tab-delimited ASCII) or **sizes#.ffa** (fixed-format ASCII):
Size distribution of undiscovered accumulations

These eight files, one for each region, present the estimates of the size distribution of the undiscovered accumulations equal to or larger than 1 million barrels of oil or 6 billion cubic feet of non-associated gas in size. Following 2 lines of header information, the data are presented in 18 columns:
(1) play -- (characters 1-4) the play number
(2) commodity -- (characters 7-15) either oil or non-associated gas
(3) median_size -- (characters 18-28) the median size of the undiscovered accumulations (in millions of barrels of oil or billions of cubic feet of non-associated gas), from the assessment input
(4) shape_factor -- (characters 31-37) the shape factor for the sizes of undiscovered accumulations, from the assessment input (See Houghton and others, 1993.)
(5) to (7) -- parameters a (characters 40-50), b (characters 52-55), and Tu (characters 57-61) of the truncated shifted Pareto (TSP) distribution fit to the median_size and shape_factor (See Houghton and others, 1993.)

(8) to (16) -- F99 (characters 63-70), F95 (characters 72-79), F90 (characters 81-88), F75 (characters 90-97), F50 (characters 99-106), F25 (characters 108-115), F10 (characters 117-124), F5 (characters 126-133), and F1 (characters 135-142), fractiles for the size distribution of undiscovered accumulations equal to or larger than 1 million barrels or 6 billion cubic feet in size; F5 means, for example, that there is a 5 percent chance of greater than the listed amount of resource (in millions of barrels of oil or billions of cubic feet of non-associated gas)
(17) max_accum_size -- (characters 145-158) the maximum size of the undiscovered accumulations (in millions of barrels of oil or billions of cubic feet of non-associated gas), from the TSP fit
(18) mean_size -- (characters 161-169) the mean size of the undiscovered accumulations (in millions of barrels of oil or billions of cubic feet of non-associated gas), from the TSP fit

tsp#.tab (tab-delimited ASCII) or **tsp#.ffa** (fixed-format ASCII):
Truncated shifted Pareto distributions of discovered accumulations

These eight files, one for each region, contain the size data for discovered accumulations and the truncated shifted Pareto (TSP) distributions fit to them. Only accumulations greater than or equal to 1 million barrels of oil or 6 billion cubic feet of gas are included in this part of the assessment. Because the raw data came from proprietary data files (especially from the NRG Associates Significant Oil and Gas Fields of the United States Data Base), only summary information on the distributions can be released. Following 2 lines of header information, the data are presented in 18 columns:
(1) play_num -- (characters 1-8) the play number
(2) commodity -- (characters 10-18) oil or non-associated gas
(3) disc_seq -- (characters 20-40) the portion of the discovery sequence (for example, the first third or the second half, as calculated by number of accumulations) or the total for that commodity
(4) date -- (characters 42-51) the date of the end of that portion of the discovery sequence
(5) total_vol -- (characters 53-61) the total volume of resource of the commodity discovered during that portion of the discovery sequence (in thousands of barrels of oil or millions of cubic feet of non-associated gas)
(6) size_mean -- (characters 63-71) the mean size of accumulations discovered during that portion of the discovery sequence (in thousands of barrels of oil or millions of cubic feet of non-associated gas)
(7) size_median -- (characters 73-83) the median size of accumulations discovered during that portion of the discovery sequence (in thousands of barrels of oil or millions of cubic feet of non-associated gas)

(8) size_max -- (characters 85-93) the maximum size of accumulations discovered during that portion of the discovery sequence (in thousands of barrels of oil or millions of cubic feet of non-associated gas)
(9) num_accums -- (characters 95-104) the number of accumulations discovered during that portion of the discovery sequence
(10) shape_factor -- (characters 106-117) the shape factor for the truncated shifted Pareto (TSP) distribution fit to the size data for accumulations discovered during that portion of the discovery sequence (See Houghton and others, 1993)
(11) to (13) -- F95 (characters 119-126), F50 (characters 128-136), and F5 (characters 138-146), fractiles for the TSP distribution of accumulations discovered during that portion of the discovery sequence; F5 means, for example, that 5 percent of the accumulations are larger than the listed amount of resource (in thousands of barrels of oil or millions of cubic feet of non-associated gas)
(14) to (18) are summary data for play totals and are on only the lines for totals of each commodity
(14) total_oil -- (characters 148-156) the total volume of oil from accumulations of the listed commodity discovered in this play (in thousands of barrels)
(15) total_gas -- (characters 158-166) the total volume of gas from accumulations of the listed commodity discovered in this play (in millions of cubic feet)
(16) total_NGL -- (characters 168-176) the total volume of natural gas liquids from accumulations of the listed commodity discovered in this play (in thousands of barrels)
(17) GOR -- (characters 178-186) the gas/oil ratio for oil accumulations discovered in this play (in cubic feet per barrel); no equivalent for non-associated gas accumulations
(18) LGR -- (characters 188-196) the NGL to gas ratio for accumulations of the listed commodity discovered in this play (in barrels per million cubic feet)

Data for Unconventional Plays

These files in directory "unconven" contain the data for the unconventional plays from the 1995 National Assessment. Two versions are given: tab-delimited ASCII (having a .tab extension) and fixed-format ASCII (having an .ffa extension) . Because of the limited number of plays, these files are not separated by region.

coalbed.tab (tab-delimited ASCII) or **coalbed.ffa** (fixed-format ASCII):
Input and results of coalbed gas assessment

These files contain both the input and the output from the assessment of coalbed gas plays. Following 2 lines of header information, the data are presented in 58 columns:
(1) geologists -- (characters 1-35) the geologist(s) responsible for this play
(2) region -- (characters 37-42) the region number
(3) province_name -- (characters 44-77) the province name
(4) province_num -- (characters 79-90) the province number

(5) date -- (characters 92-98) the date of the assessment
(6) play_name -- (characters 100-146) the play name
(7) play_num -- (characters 148-155) the play number
(8) hypo_or_conf -- (characters 157-168) whether the play is hypothetical or confirmed
(9) play_prob -- (characters 170-178) the play probability
(10) cell_size_acres -- (characters 180-194) the cell size in acres
(11) cell_size_sqmi -- (characters 196-209) the cell size in square miles
(12) area_of_play -- (characters 211-222) the area of the play in square miles
(13) num_cells -- (characters 224-232) the total number of cells in the play
(14) num_prod_cells -- (characters 234-247) the number of producing cells in the play
(15) num_nonprod_cells -- (characters 249-265) the number of nonproducing (but tested) cells in the play
(16) cells_med -- (characters 267-275) the median number of untested cells in the play
(17) cells_min -- (characters 277-285) the minimum number of untested cells in the play
(18) cells_max -- (characters 287-295) the maximum number of untested cells in the play
(19) success_ratio -- (characters 297-309) the success ratio
(20) to (26) -- EUR_F100 (characters 311-318), EUR_F95 (characters 320-326), EUR_F75 (characters 328-334), EUR_F50 (characters 336-342), EUR_F25 (characters 344-350), EUR_F5 (characters 352-357), and EUR_F0 (characters 359-364), fractiles for the distribution of estimated ultimate recovery (EUR); EUR_F5 means, for example, that there is a 5 percent chance of greater than the listed amount of resource (in millions of cubic feet of gas)
(27) depth_med -- (characters 366-374) the median depth to the resource (in feet)
(28) depth_min -- (characters 376-384) the minimum depth to the resource (in feet)
(29) depth_max -- (characters 386-394) the maximum depth to the resource (in feet)
(30) mean_thick -- (characters 396-405) the mean net thickness of potentially productive coal (in feet)
(31) max_thick -- (characters 407-415) the maximum net thickness of potentially productive coal (in feet)
(32) num_seams -- (characters 417-425) the mean number of coal seams
(33) thick_interval -- (characters 427-440) the mean thickness of the coal-bearing interval
(34) TDS -- (characters 442-446) the water quality as total dissolved solids (TDS) (in ppm)
(35) treatment -- (characters 448-478) the present method of water treatment
(36) C1 -- (characters 480-483) the percent of methane in the gas
(37) C2+ -- (characters 485-487) the percent of heavier hydrocarbons in the gas
(38) CO2 -- (characters 489-491) the percent of carbon dioxide in the gas
(39) N2 -- (characters 493-495) the percent of nitrogen in the gas
(40) BTU -- (characters 497-500) the heating value of the gas (in BTU)
(41) liquids? -- (characters 502-509) whether there are liquid hydrocarbons in the gas (yes or no)
(42) active_mining? -- (characters 511-524) whether there is active coal mining in the play (yes or no)

(43) seams -- (characters 526-597) which seams, if any, are being actively mined
(44) mined_out_sqmi -- (characters 599-612) the mined-out area in square miles
(45) mined_out_% -- (characters 614-624) the mined-out area in percent
(46) compression? -- (characters 626-637) whether compression is needed (yes or no)
(47) stimulated? -- (characters 639-649) whether gas wells are stimulated (yes or no)
(48) analog_play -- (characters 651-722) the analog play used when no production data were available
(49) num_cells_mean -- (characters 724-737) the mean number of untested cells
(50) depth_mean -- (characters 739-748) the mean depth to the resource (in thousands of feet)
(51) EUR_mean -- (characters 750-757) the mean EUR (in billions of cubic feet of gas)
(52) gas_mean -- (characters 759-766) the mean volume of potential reserve additions of gas (in billions of cubic feet)
(53) gas_sd -- (characters 768-774) the standard deviation of the distribution of volume of potential reserve additions of gas (in billions of cubic feet)
(54) to (58) -- gas_F95 (characters 776-782), gas_F75 (characters 784-790), gas_F50 (characters 792-798), gas_F25 (characters 800-806), and gas_F5 (characters 808-814), fractiles for the distribution of volume of potential reserve additions of gas; gas_F5 means, for example, that there is a 5 percent chance of greater than the listed amount of resource (in billions of cubic feet)

continus.tab (tab-delimited ASCII) or **continus.ffa** (fixed-format ASCII):
Input and results of continuous-type play assessment

These files contain both the input and the output from the assessment of continuous-type plays. Following 2 lines of header information, the data are presented in 59 columns:
(1) geologists -- (characters 1-40) the geologist(s) responsible for this play
(2) region -- (characters 42-47) the region number
(3) province_name -- (characters 49-81) the province name
(4) province_num -- (characters 83-94) the province number
(5) date -- (characters 96-103) the date of the assessment
(6) play_name -- (characters 105-183) the play name
(7) play_num -- (characters 185-192) the play number
(8) scenario_prob -- (characters 194-206) the probability of occurrence of the scenario, when two separate appraisal scenarios were used
(9) play_type -- (characters 208-216) the play type (oil or gas)
(10) hypo_or_conf -- (characters 218-229) whether the play is hypothetical or confirmed
(11) play_prob -- (characters 231-239) the play probability
(12) cell_size_acres -- (characters 241-255) the cell size in acres
(13) cell_size_sqmi -- (characters 257-270) the cell size in square miles
(14) area_of_play -- (characters 272-283) the area of the play in square miles

(15) num_cells -- (characters 285-293) the total number of cells in the play
(16) num_prod_cells -- (characters 295-308) the number of producing cells in the play
(17) num_nonprod_cells -- (characters 310-326) the number of nonproducing (but tested) cells in the play
(18) cells_med -- (characters 328-336) the median number of untested cells in the play
(19) cells_min -- (characters 338-346) the minimum number of untested cells in the play
(20) cells_max -- (characters 348-356) the maximum number of untested cells in the play
(21) success_ratio -- (characters 358-370) the success ratio
(22) to (28) -- EUR_F100 (characters 372-379), EUR_F95 (characters 381-387), EUR_F75 (characters 389-395), EUR_F50 (characters 397-403), EUR_F25 (characters 405-411), EUR_F5 (characters 413-419), and EUR_F0 (characters 421-427), fractiles for the distribution of estimated ultimate recovery (EUR); EUR_F5 means, for example, that there is a 5 percent chance of greater than the listed amount of resource (in barrels of oil or millions of cubic feet of gas)
(29) GOR -- (characters 429-432) the gas-to-oil ratio (in cubic feet of gas to barrel of oil)
(30) LGR -- (characters 434-438) the natural-gas-liquids to gas ratio (in barrels of liquid to millions of cubic feet of gas)
(31) depth_med -- (characters 440-448) the median depth to the resource (in feet)
(32) depth_min -- (characters 450-458) the minimum depth to the resource (in feet)
(33) depth_max -- (characters 460-468) the maximum depth to the resource (in feet)
(34) targeted_to_play -- (characters 470-485) the fraction of untested cells likely to be targeted for the play itself
(35) targeted_deeper -- (characters 487-501) the fraction of untested cells likely to be targeted for deeper horizons
(36) targeted_shallower -- (characters 503-520) the fraction of untested cells likely to be targeted for shallower horizons
(37) API_gravity -- (characters 522-532) the API gravity of the hydrocarbon liquids (in degrees)
(38) FERC_fraction -- (characters 534-546) the fraction (0 to 1) of the play having "tight" FERC (Federal Energy Regulatory Commission) designation
(39) off-limits_fraction -- (characters 548-566) the fraction (0 to 1) of the play presently off-limits to drilling
(40) stimulated_fraction -- (characters 568-586) the fraction (0 to 1) of the play that is likely to require stimulated wells
(41) scenario -- (characters 588-634) the scenario name, when two separate appraisal scenarios were used
(42) distribution -- (characters 636-647) the distribution used for number of untested cells
(43) num_cells_mean -- (characters 649-662) the mean number of untested cells
(44) depth_mean -- (characters 664-673) the mean depth to the resource (in thousands of feet)
(45) EUR_mean -- (characters 675-682) the mean EUR (in millions of barrels of oil or billions of cubic feet of gas)

(46) gas_mean -- (characters 684-694) the mean volume of potential reserve additions of gas (in billions of cubic feet)
(47) gas_sd -- (characters 696-706) the standard deviation of the distribution of volume of potential reserve additions of gas (in billions of cubic feet)
(48) to (52) -- gas_F95 (characters 708-718), gas_F75 (characters 720-730), gas_F50 (characters 732-742), gas_F25 (characters 744-754), and gas_F5 (characters 756-766), fractiles for the distribution of volume of potential reserve additions of gas; gas_F5 means, for example, that there is a 5 percent chance of greater than the listed amount of resource (in billions of cubic feet)
(53) liq_mean -- (characters 768-776) the mean volume of potential reserve additions of liquids (in millions of barrels)
(54) liq_sd -- (characters 778-786) the standard deviation of the distribution of volume of potential reserve additions of liquids (in millions of barrels)
(55) to (59) -- liq_F95 (characters 788-796), liq_F75 (characters 798-806), liq_F50 (characters 808-816), liq_F25 (characters 818-826), and liq_F5 (characters 828-837), fractiles for the distribution of volume of potential reserve additions of liquid (oil for oil plays, NGL for gas plays); liq_F5 means, for example, that there is a 5 percent chance of greater than the listed amount of resource (in millions of barrels)

Aggregate Data

Four files in the directory "aggregat" (provnosf.tab or .ffa, provsf.tab or .ffa, regsf.tab or .ffa, and smfld.tab or .ffa) contain aggregate data for the provinces and regions from the 1995 National Assessment. All of these aggregations include only conventional resources; no unconventional resources are contained in these aggregations. The provnosf.tab or .ffa files contain the fractile distribution of undiscovered resources by province for only those accumulations greater than or equal to 1 million barrels of oil or 6 billion cubic feet of gas. The provsf.tab or .ffa files contain the fractile distribution of undiscovered resources by province for ALL accumulations, an aggregation of both large (greater than or equal to 1 million barrels of oil or 6 billion cubic feet of gas) and small accumulations (less than 1 million barrels of oil or 6 billion cubic feet of gas). The regsf.tab or .ffa files contain the fractile distribution of undiscovered resources by region for ALL accumulations, an aggregation of both large (greater than or equal to 1 million barrels of oil or 6 billion cubic feet of gas) and small accumulations (less than 1 million barrels of oil or 6 billion cubic feet of gas). The smfld.tab or .ffa files contain the fractile distribution of undiscovered resources by region for only those accumulations less than 1 million barrels of oil or 6 billion cubic feet of gas. Two versions are given: tab-delimited ASCII (.tab) and fixed-format ASCII (.ffa).

provnosf.tab (tab-delimited ASCII) or **provnosf.ffa** (fixed-format ASCII):
Aggregation by province of large accumulations

These files contain the fractile distribution of undiscovered resources by province only for accumulations greater than or equal to 1 million barrels of oil or 6 billion cubic feet of gas. Following two lines of header information, the data are presented in six columns:
(1) province -- (characters 1-10) the province number
(2) commodity -- (characters 12-21) either oil, non-associated gas, or natural gas liquids (NGL)
(3) to (5) -- F95 (characters 23-32), F50 (characters 34-43), and F05 (characters 45-54) fractiles for the distribution of amount of undiscovered resource; F05 means, for example, that there is a 5 percent chance of greater than the listed amount of resource (in millions of barrels of oil, billions of cubic feet of non-associated gas, or millions of barrels of natural gas liquids)
(6) mean -- (characters 56-65) the mean estimate (in millions of barrels or billions of cubic feet) of volume of undiscovered oil, non-associated gas, or natural gas liquids

provsf.tab (tab-delimited ASCII) or **provsf.ffa** (fixed-format ASCII):
Aggregation by province of large and small accumulations

These files contain the fractile distribution of undiscovered resources by province for ALL accumulations, an aggregation of both large (greater than or equal to 1 million barrels of oil or 6 billion cubic feet of gas) and small accumulations (less than 1 million barrels of oil or 6 billion cubic feet of gas). Following two lines of header information, the data are presented in six columns:
(1) province -- (characters 1-10) the province number
(2) commodity -- (characters 12-21) either oil, non-associated gas, or natural gas liquids (NGL)
(3) to (5) -- F95 (characters 23-32), F50 (characters 34-43), and F05 (characters 45-54), fractiles for the distribution of amount of undiscovered resource; F05 means, for example, that there is a 5 percent chance of greater than the listed amount of resource (in millions of barrels of oil, billions of cubic feet of non-associated gas, or millions of barrels of natural gas liquids)
(6) mean -- (characters 56-65) the mean estimate (in millions of barrels or billions of cubic feet) of volume of undiscovered oil, non-associated gas, or natural gas liquids

regsf.tab (tab-delimited ASCII) or **regsf.ffa** (fixed-format ASCII):
Aggregation by region of large and small accumulations

These files contain the fractile distribution of undiscovered resources by region for ALL accumulations, an aggregation of both large (greater than or equal to 1 million barrels of oil or 6 billion cubic feet of gas) and small accumulations (less than 1 million barrels of

oil or 6 billion cubic feet of gas). Following two lines of header information, the data are presented in six columns:
(1) region -- (characters 1-10) the region number
(2) commodity -- (characters 12-21) either oil, non-associated gas, or natural gas liquids (NGL)
(3) to (5) -- F95 (characters 23-32), F50 (characters 34-43), and F05 (characters 45-54), fractiles for the distribution of amount of undiscovered resource; F05 means, for example, that there is a 5 percent chance of greater than the listed amount of resource (in millions of barrels of oil, billions of cubic feet of non-associated gas, or millions of barrels of natural gas liquids)
(6) mean -- (characters 56-65) the mean estimate (in millions of barrels or billions of cubic feet) of volume of undiscovered oil, non-associated gas, or natural gas liquids

smfld.tab (tab-delimited ASCII) or **smfld.ffa** (fixed-format ASCII):
Assessment of small accumulations

These files contain the fractile distribution of undiscovered resources by region for SMALL accumulations, those accumulations less than 1 million barrels of oil or 6 billion cubic feet of gas. Following two lines of header information, the data are presented in eight columns:
(1) province -- (characters 1-10) the province number
(2) oil -- (characters 12-21) the mean estimate (in millions of barrels) of volume of undiscovered oil
(3) assoc_gas -- (characters 23-32) the mean estimate (in billions of cubic feet) of volume of undiscovered associated gas
(4) non-assoc_gas -- (characters 34-46) the mean estimate (in billions of cubic feet) of volume of undiscovered non-associated gas
(5) total_gas -- (characters 48-57) the mean estimate (in billions of cubic feet) of volume of undiscovered total natural gas (associated and non-associated gas)
(6) assoc_gas_liquids -- (characters 59-75) the mean estimate (in millions of barrels) of volume of undiscovered associated gas liquids
(7) non-assoc_gas_liquids -- (characters 77-97) the mean estimate (in millions of barrels) of volume of undiscovered non-associated gas liquids
(8) total_ngl -- (characters 99-108) the mean estimate (in millions of barrels) of volume of undiscovered total natural gas liquids (associated and non-associated)

Region, Province, and Play Codes

These files (in the directories "play" and "province") contain the code numbers and official names for the USGS assessment regions, provinces, and plays. Two versions are

given: tab-delimited ASCII (having a .tab extension) and fixed-format ASCII (having an .ffa extension).

play.tab (tab-delimited ASCII) or **play.ffa** (fixed-format ASCII):
Play numbers and names

This file gives the play numbers and names. The first two digits of the play number (the first digit in three-digit play numbers) refer to the main province with which the play is associated. Following two lines of header information, the data are presented in two columns:
(1) play_num -- (characters 1-8) the play number
(2) play_name -- (characters 10-136) the play name

province.tab (tab-delimited ASCII) or **province.ffa** (fixed-format ASCII):
Province and region numbers and names

This file gives the region names and numbers, the province names and numbers by region, and the geologist(s) responsible for assessment of each province. Following two lines of header information, the data are presented in five columns:
(1) region_num -- (characters 1-10) the region number
(2) region_name -- (characters 12-52) the region name
(3) province_num -- (characters 54-65) the province number
(4) province_name -- (characters 67-108) the province name
(5) geologists -- (characters 110-140) the geologist(s) responsible for the assessment of that province

PROGRAMS

Selected programs used in the 1995 National assessment are presented here along with documentation.

National Oil and Gas Assessment Programs

The source codes for three assessment programs (nog2.f, nog3.f, and nog6.f) are presented on this CD-ROM for their possible utility to appraisers. These are in the directory "programs." The programs were written in Green Hills FORTRAN77 with a UNIX operating system. The source code is included. Explanatory notes are at the beginning of the source code for each program.

The programs were set up to accomodate files in a particular format. The input files must be formatted in the following manner:

(1) A file named "playfile" should contain the list of plays and have the play file names in columns 24-31.
(2) Data files for individual plays (referred to as the #.dat files) should include 92 lines and have data in columns 1-8. Only 14 of the lines are accessed by these programs:
line 13 -- the play probability
line 34 -- gas-oil ratio (in cubic feet of gas per barrel)
line 35 -- ratio of NGL to non-associated gas (in barrels per million cubic feet)
line 36 -- ratio of NGL to associated-dissolved gas (in barrels per million cubic feet)
line 56 -- the median size of the undiscovered oil accumulations (in millions of barrels)
line 57 -- the median size of the undiscovered gas accumulations (in billions of cubic feet)
line 73 -- the TSP shape factor for the undiscovered oil accumulations (See Houghton and others, 1993.)
line 74 -- the TSP shape factor for the undiscovered gas accumulations (See Houghton and others, 1993.)
line 79 -- the minimum number of undiscovered oil accumulations
line 80 -- the minimum number of undiscovered gas accumulations
line 81 -- the median number of undiscovered oil accumulations
line 82 -- the median number of undiscovered gas accumulations
line 83 -- the maximum number of undiscovered oil accumulations
line 84 -- the maximum number of undiscovered gas accumulations
The original #.dat files are not included on this disk, but the data is in the conv#in.ffa and conv#in.tab files.

nog2.f:
Program to assess undiscovered conventional accumulations

This program was used to generate the data in the conv#out.ffa and conv#.out.tab files. The output file has ten columns:
(1) plays (identified by code number)
(2) mean number of oil accumulations in each play
(3) the mean size of the oil accumulations (in millions of barrels)
(4) the mean amount of oil in the play (in millions of barrels)
(5) the mean amount of associated gas (in billions of cubic feet)
(6) the mean amount of natural gas liquids in the associated gas (in millions of barrels)
(7) the mean number of non-associated gas accumulations
(8) the mean size of the non-associated gas accumulations (in billions of cubic feet)
(9) the mean amount of non-associated gas in the play (in billions of cubic feet)
(10) the mean amount of natural gas liquids in the non-associated gas accumulations (in millions of barrels)
The resulting output file will be named nog2.prn. The file **nog2.ttl** is used by nog2.f and contains the column titles for nog2.prn.

nog3.f:
Program to generate fractiles from assessment of undiscovered conventional accumulations

This program was used to generate the data in the frac#.ffa and frac#.tab files. This is a Monte Carlo simulation program. Its output is a table of quantiles of the amount of oil in each play at various probabilities and the amount of non-associated gas at various probabilities. The number of iterations is determined by the value of the variable "itr" in the program, which is set to 9999 in the source code. Units: gas in billions of cubic feet, oil in millions of barrels. The resulting output file will be named nog3.prn. The file **nog3.ttl** is used by nog3.f and contains column titles for nog3.prn.

nog6.f:
Another program to generate fractiles from assessment of undiscovered conventional accumulations

This is a Monte Carlo simulation program. Its output is a table of 101 percentiles (from 0 percent through 100 percent) for the distribution of oil in oil accumulations and gas in non-associated gas accumulations. These distributions are based upon 9999 iterations wherein the number and sizes of accumulations are repeatedly sampled with the aid of a random number generator and the play assessment files (#.dat). The input files are (1) "playfile" and (2) the #.dat files. There is one output file for each play, named play#.dis, which contains an empirical distribution for the quantity of oil and gas in the play.

Description of a Discovery Process Modeling Procedure to Forecast Future Oil and Gas Using Field Growth, ARDS 4.01

This program (also in the directory "programs") was used to calculate inferred conventional reserves of oil and gas. The documentation is divided into five files, presented in Microsoft Word for Macintosh format, version 5.1a (.mwm), in rich text format (.rtf), or in Word Perfect for Windows format (.wpw).

ardstxt.mwm (Microsoft Word for Macintosh), **ardstxt.rtf** (rich text format), and **ardstxt.wpw** (Word Perfect for Windows):

Main body of the text

ardsfig.mwm (Microsoft Word for Macintosh), **ardsfig.rtf** (rich text format), and **ardsfig.wpw** (Word Perfect for Windows):

Figures 3, 4, and 6 (figures 1, 2, and 5 are stored as JPEG images in files fig1.jpg, fig2.jpg, fig5a.jpg, and fig5b.jpg.)

ardsexh.mwm (Microsoft Word for Macintosh), **ardsexh.rtf** (rich text format), and **ardsexh.wpw** (Word Perfect for Windows):

Exhibits 1 through 15

ardsapa.mwm (Microsoft Word for Macintosh), **ardsapa.rtf** (rich text format), and **ardsapa.wpw** (Word Perfect for Windows):

Appendix A -- Example of use (Output images are stored as files having .jpg extensions.)

ardsapb.mwm (Microsoft Word for Macintosh), **ardsapb.rtf** (rich text format), and **ardsapb.wpw** (Word Perfect for Windows):

Appendix B -- Program listings

CREDITS

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William R. Beeman	Map viewer programming; CD-ROM organization.
Dianne L. Barnett	Compilation of gas hydrate maps.

Shirley A. Oscarson	Formatting of geologic text.
Gordon L. Dolton Katharine L. Varnes Frederick N. Zihlman	Review of CD-ROM text and images.
Richard O. Butler	Editing and production of stratigraphic columns.
Eugene G. Ellis Mitchell E. Henry	Review of readme file.

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Appendix A

REGION AND PROVINCE NAMES

Region 1 -- Alaska

Province 1	Northern Alaska
Province 2	Central Alaska
Province 3	Southern Alaska

Region 2 -- Pacific Coast

Province 4	Western Oregon - Washington
Province 5	Eastern Oregon - Washington
Province 6	Klamath - Sierra Nevada
Province 7	Northern Coastal
Province 8	Sonoma - Livermore Basin
Province 9	Sacramento Basin
Province 10	San Joaquin Basin
Province 11	Central Coastal
Province 12	Santa Maria Basin
Province 13	Ventura Basin
Province 14	Los Angeles Basin
Province 15	San Diego - Oceanside
Province 16	Salton Trough

Region 3 -- Colorado Plateau and Basin and Range

Province 17	Idaho - Snake River Downwarp
Province 18	Western Great Basin
Province 19	Eastern Great Basin
Province 20	Uinta - Piceance Basin
Province 21	Paradox Basin
Province 22	San Juan Basin
Province 23	Albuquerque - Santa Fe Rift
Province 24	Northern Arizona
Province 25	Southern Arizona - Southwestern New Mexico
Province 26	South-Central New Mexico

Region 4 -- Rocky Mountains and Northern Great Plains

Province 27	Montana Thrust Belt
Province 28	North-Central Montana
Province 29	Southwest Montana
Province 31	Williston Basin
Province 32	Sioux Arch

Province 33 Powder River Basin
Province 34 Big Horn Basin
Province 35 Wind River Basin
Province 36 Wyoming Thrust Belt
Province 37 Southwestern Wyoming
Province 38 Park Basins
Province 39 Denver Basin
Province 40 Las Animas Arch
Province 41 Raton Basin - Sierra Grande Uplift

Region 5 -- West Texas and Eastern New Mexico
Province 42 Pedernal Uplift
Province 43 Palo Duro Basin
Province 44 Permian Basin
Province 45 Bend Arch - Fort Worth Basin
Province 46 Marathon Thrust Belt

Region 6 -- Gulf Coast
Province 47 Western Gulf
Province 48 East Texas Basin
Province 49 Louisiana-Mississippi Salt Basins
Province 50 Florida Peninsula

Region 7 -- Midcontinent
Province 51 Superior
Province 52 Iowa Shelf
Province 53 Cambridge Arch - Central Kansas Uplift
Province 54 Salina Basin
Province 55 Nemaha Uplift
Province 56 Forest City Basin
Province 57 Ozark Uplift
Province 58 Anadarko Basin
Province 59 Sedgwick Basin
Province 60 Cherokee Platform
Province 61 Southern Oklahoma
Province 62 Arkoma Basin

Region 8 -- Eastern
Province 63 Michigan Basin
Province 64 Illinois Basin
Province 65 Black Warrior Basin
Province 66 Cincinnati Arch
Province 67 Appalachian Basin

Province 68	Blue Ridge Thrust Belt
Province 69	Piedmont
Province 70	Atlantic Coastal Plain
Province 71	Adirondack Uplift
Province 72	New England

Appendix B

CHAPTER FILE NAMES

The following is a list of filenames (in the "chapters" directory) and the corresponding titles for chapters in DDS-30 in the original order. Each text file is available in two forms: formatted text (.ans extension) and rich text format (.rtf extension). JPEG (.jpg extension) and Adobe Illustrator (.ai extension) versions of the figures and tables have filenames that begin with the same characters as the text filename. Because of the large number of files associated with the executive summary and the methane hydrates chapters, these two groups of files have been placed in subdirectories, "execsum" and "hydrates," respectively.

Filename	**Title/Subject**
execsum	Executive summary of results, "1995 National assessment of United States oil and gas resources" by U.S. Geological Survey National Oil and Gas Resource Assessment Team (executive summary files are located in the "execsum" subdirectory below the "chapters" directory)
intro	"Introduction, purpose and scope" by D.L. Gautier
dn30	"CD-ROM design notes" by K.I.Takahashi
method	"Methodology for assessment of undiscovered conventional accumulations" by D.L. Gautier and G.L. Dolton
hydrcarb	"Method for assessing continuous-type (unconventional) hydrocarbon accumulations" by J.W. Schmoker
coalgas	"Methodology for assessment of technically recoverable resources of coalbed gas" by D.D. Rice, G.B.C. Young, and G.W. Paul
probmeth	"Probabilistic methodology and computer programs for assessment of unconventional oil and gas resources" by R.A. Crovelli and R.H. Balay
gasres	"Deep natural gas reservoirs and conventional plays in the United States" by T.S. Dyman, M.S. Wilson, and W.R. Beeman
heavyoil	"Heavy-oil resources of the United States" by Mark Pawlewicz

hydrate	"Gas hydrate resources of the United States" by T.S. Collet (gas hydrate files are located in the "hydrates" subdirectory below the "chapters" directory)
gisdoc	"Development and use of a geographic information system (GIS) for resource appraisal" by W.R. Beeman
annbib	"Annotated bibliography of methodology for assessment of undiscovered oil and gas resources" by R.R. Charpentier, G.L. Dolton, and G.F. Ulmishek
playintr	"Introduction to play narratives" by K.L. Varnes
conttype	"Introduction to narratives for continuous-type accumulations" by J.W. Schmoker
cbm	"Geologic framework and description of coalbed gas plays" by D.D. Rice

Appendix C

DIRECTORY TREE STRUCTURE

The following is the directory tree structure of this CD-ROM (DDS-36). Listed are the directory names and associated files within each directory. All file names include a period followed by a two or three character extension. Directory or subdirectory names have no periods, and in the ".rtf" version of this file are in boldface.

Root directory:

aggregat
- provnosf.ffa
- provnosf.tab
- provsf.ffa
- provsf.tab
- regsf.ffa
- regsf.tab
- smfld.ffa
- smfld.tab

authors.ans

chapters
- annbib.ans
- annbib.rtf
- cbm.ans
- cbm.rtf
- cbm1.ai
- cbm1.jpg
- cbm2.ai
- cbm2.jpg
- cbm3.ai
- cbm3.jpg
- coalgas.ans
- coalgas.rtf
- coalgas1.ai
- coalgas1.jpg
- coalgas2.ai
- coalgas2.jpg
- coalgas3.ai
- coalgas3.jpg
- coalgas4.ai
- coalgas4.jpg

coalgas5.ai
coalgas5.jpg
coalgas6.ai
coalgas6.jpg
conttype.ans
conttype.rtf
conttyp1.ai
conttyp1.jpg
conttyp2.ai
conttyp2.jpg
conttyp3.ai
conttyp3.jpg
conttyp4.ai
conttyp4.jpg
dn30.ans
dn30.rtf
execsum
- execsum.ans
- execsum.rtf
- fig1.jpg
- fig2.jpg
- fig3.jpg
- fig4.jpg
- fig5.jpg
- fig6.jpg
- fig7.jpg
- fig8.jpg
- fig9.jpg
- fig10.jpg
- fig11.jpg
- fig12.jpg
- fig13.jpg
- table1.jpg
- table2a.jpg
- table2b.jpg
- table2c.jpg
- table2d.jpg
- table3.jpg
- table4a.jpg
- table4b.jpg
- table5a.jpg
- table5b.jpg

gasres.ans

gasres.rtf
gasres1.ai
gasres1.jpg
gasres2.ai
gasres2.jpg
gisdoc.ans
gisdoc.rtf
heavyoil.ans
heavyoil.rtf
hydrates
- akon_hys.lin
- akon_ply.lin
- alsk_bat.lin
- alsk_eez.lin
- alsk_gtg.lin
- alsk_hys.lin
- alsk_ply.lin
- alsk_sbt.lin
- alsk_sed.lin
- alsk_toc.lin
- atmx_bat.lin
- atmx_eez.lin
- atmx_gtg.lin
- atmx_hys.lin
- atmx_ply.lin
- atmx_sbt.lin
- atmx_sed.lin
- atmx_toc.lin
- hydrate.ans
- hydrate.rtf
- hydrfg1.ai
- hydrfg1.jpg
- hydrfg2.ai
- hydrfg2.jpg
- hydrfg3a.ai
- hydrfg3a.jpg
- hydrfg3b.ai
- hydrfg3b.jpg
- hydrfg3c.ai
- hydrfg3c.jpg
- hydrfg5.ai
- hydrfg5.jpg
- hydrfg17.ai

hydrfg17.jpg
hydrpl1.ai
hydrpl1.jpg
hydrpl2.ai
hydrpl2.jpg
hydrpl3.ai
hydrpl3.jpg
hydrpl4.ai
hydrpl4.jpg
hydrpl5.ai
hydrpl5.jpg
hydrpl6.ai
hydrpl6.jpg
hydrpl7.ai
hydrpl7.jpg
hydrpl8.ai
hydrpl8.jpg
hydrpl9.ai
hydrpl9.jpg
hydrpl10.ai
hydrpl10.jpg
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hydrpl11.jpg
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hydrpl12.jpg
hydrpl13.ai
hydrpl13.jpg
hydrpl14.ai
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hydrpl15.ai
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hydrpl16.ai
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hydrpl18.ai
hydrpl18.jpg
hydrpl19.ai
hydrpl19.jpg
hydrpl20.ai
hydrpl20.jpg
hydrpl21.ai
hydrpl21.jpg

hydrpl22.ai
hydrpl22.jpg
hydrpl23.ai
hydrpl23.jpg
hydvu20.exe
paco_bat.lin
paco_eez.lin
paco_gtg.lin
paco_hys.lin
paco_ply.lin
paco_sbt.lin
paco_sed.lin
paco_toc.lin
hydrcarb.ans
hydrcarb.rtf
hydrcar1.ai
hydrcar1.jpg
hydrcar2.ai
hydrcar2.jpg
hydrcar3.ai
hydrcar3.jpg
hydrcar4.ai
hydrcar4.jpg
hydrcar6.ai
hydrcar6.jpg
hydrcar7.ai
hydrcar7.jpg
intro.ans
intro.rtf
method.ans
method.rtf
playintr.ans
playintr.rtf
probmeth.ans
probmeth.rtf
prob1.ai
prob1.jpg
prob2.ai
prob2.jpg
prob3.ai
prob3.jpg
cshowa.exe
dds30.err

disclaim.ans
permissn.jpg
play
    play.ffa
    play.tab
programs
    ardsapa.mwm
    ardsapa.rtf
    ardsapa.wpw
    ardsapb.mwm
    ardsapb.rtf
    ardsapb.wpw
    ardsexh.mwm
    ardsexh.rtf
    ardsexh.wpw
    ardsfig.mwm
    ardsfig.rtf
    ardsfig.wpw
    ardstxt.mwm
    ardstxt.rtf
    ardstxt.wpw
    arnlss.jpg
    cdrap.jpg
    equata.jpg
    equatb.jpg
    fig1.jpg
    fig2.jpg
    fig5a.jpg
    fig5b.jpg
    grobar.jpg
    grobar2.jpg
    grolw.jpg
    gronpp.jpg
    gropla.jpg
    gropla2.jpg
    grougc.jpg
    llmap.jpg
    nog2.f
    nog2.ttl
    nog3.f
    nog3.ttl
    nog6.f
    p653.jpg

province
- province.ffa
- province.tab

readme.ans
readme.rtf
region1
- conv1in.ffa
- conv1in.tab
- conv1out.ffa
- conv1out.tab
- correl_1.ffa
- correl_1.tab
- depend1.ffa
- depend1.tab
- **exp1**
  - exp0103.ffa
  - exp0103.tab
  - exp0104.ffa
  - exp0104.tab
  - exp0109.ffa
  - exp0109.tab
  - exp0111.ffa
  - exp0111.tab
  - exp0303.ffa
  - exp0303.tab
  - exp0304.ffa
  - exp0304.tab
- frac1.ffa
- frac1.tab
- hist1.ffa
- hist1.tab
- **prov01**
  - pr1st.ai
  - pr1st.jpg
  - prov01.ans
  - prov01.rtf
- **prov02**
  - pr2st.ai
  - pr2st.jpg
  - prov02.ans
  - prov02.rtf
- **prov03**
  - pr3ast.ai

pr3ast.jpg
pr3bst.ai
pr3bst.jpg
prov03.ans
prov03.rtf
reg1.ans
reg1.rtf
sizes1.ffa
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region2
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prov04.rtf

prov05

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prov05.ans
prov05.rtf

prov06

prov06.ans
prov06.rtf

prov07

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pr7st.jpg
prov07.ans
prov07.rtf

prov08

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prov08.ans
prov08.rtf

prov09

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prov10

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prov11

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prov12

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prov13

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prov17.rtf
prov18
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pr18bst.ai
pr18bst.jpg
prov18.ans
prov18.rtf
prov19
pr19st.ai
pr19st.jpg
prov19.ans
prov19.rtf
prov20
pr20st.ai

pr20st.jpg
prov20.ans
prov20.rtf
prov21
pr21st.ai
pr21st.jpg
prov21.ans
prov21.rtf
prov22
pr22st.ai
pr22st.jpg
prov22.ans
prov22.rtf
prov23
pr23st.ai
pr23st.jpg
prov23.ans
prov23.rtf
prov24
pr24st.ai
pr24st.jpg
prov24.ans
prov24.rtf
prov25
pr25st.ai
pr25st.jpg
prov25.ans
prov25.rtf
prov26
pr26st.ai
pr26st.jpg
prov26.ans
prov26.rtf
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reg3.rtf
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tsp3.tab
region4
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conv4in.tab
conv4out.ffa

conv4out.tab
correl_4.ffa
correl_4.tab
depend4.ffa
depend4.tab
exp4
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- exp2701.tab
- exp2805.ffa
- exp2805.tab
- exp2806.ffa
- exp2806.tab
- exp2807.ffa
- exp2807.tab
- exp2808.ffa
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- exp2809.tab
- exp2901.ffa
- exp2901.tab
- exp2903.ffa
- exp2903.tab
- exp3101.ffa
- exp3101.tab
- exp3102.ffa
- exp3102.tab
- exp3103.ffa
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- exp3305.ffa
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- exp3306.ffa
- exp3306.tab
- exp3307.ffa

exp3307.tab
exp3309.ffa
exp3309.tab
exp3310.ffa
exp3310.tab
exp3312.ffa
exp3312.tab
exp3313.ffa
exp3313.tab
exp3402.ffa
exp3402.tab
exp3403.ffa
exp3403.tab
exp3406.ffa
exp3406.tab
exp3501.ffa
exp3501.tab
exp3502.ffa
exp3502.tab
exp3503.ffa
exp3503.tab
exp3504.ffa
exp3504.tab
exp3604.ffa
exp3604.tab
exp3701.ffa
exp3701.tab
exp3702.ffa
exp3702.tab
exp3703.ffa
exp3703.tab
exp3704.ffa
exp3704.tab
exp3705.ffa
exp3705.tab
exp3707.ffa
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exp3903.ffa
exp3903.tab

exp3905.ffa
exp3905.tab
exp3907.ffa
exp3907.tab
exp3908.ffa
exp3908.tab
exp4001.ffa
exp4001.tab
exp4004.ffa
exp4004.tab
exp4005.ffa
exp4005.tab
frac4.ffa
frac4.tab
hist4.ffa
hist4.tab
prov27
pr27st.ai
pr27st.jpg
prov27.ans
prov27.rtf
prov28
pr28st.ai
pr28st.jpg
prov28.ans
prov28.rtf
prov29
pr29st.ai
pr29st.jpg
prov29.ans
prov29.rtf
prov31
pr31st.ai
pr31st.jpg
prov31.ans
prov31.rtf
prov32
pr32st.ai
pr32st.jpg
prov32.ans
prov32.rtf
prov33
pr33st.ai

pr33st.jpg
prov33.ans
prov33.rtf

prov34

pr34st.ai
pr34st.jpg
prov34.ans
prov34.rtf

prov35

pr35st.ai
pr35st.jpg
prov35.ans
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prov36

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prov37

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prov37.ans
prov37.rtf

prov38

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pr38st.jpg
prov38.ans
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prov40

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prov44.ans
prov44.rtf
prov45
pr45st.ai
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prov45.ans
prov45.rtf
prov46
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prov49.ans
prov49.rtf
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prov54

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prov55

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prov56

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prov57

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pr65st.ai

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prov67
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prov68
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pr72bst.jpg
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Appendix D

OUTLINE OF DDS-30

Executive summary of results, "1995 National assessment of United States oil and gas resources" by U.S. Geological Survey National Oil and Gas Resource Assessment Team
"Introduction, purpose and scope" by D.L. Gautier
"CD-ROM design notes" by K.I. Takahashi

METHODOLOGY

A. Assessment of conventional oil and gas
   1. "Methodology for assessment of undiscovered conventional accumulations" by D.L. Gautier and G.L. Dolton
   2. "Deep natural gas reservoirs and conventional plays in the United States" by T.S. Dyman, M.S. Wilson, and W.R. Beeman

B. Assessment of unconventional oil and gas
   1. "Probabilistic methodology and computer programs for assessment of unconventional oil and gas resources" by R.A. Crovelli and R.H. Balay
   2. "Method for assessing continuous-type (unconventional) hydrocarbon accumulations" by J.W. Schmoker
   3. "Methodology for assessment of technically recoverable resources of coalbed gas" by D.D. Rice, G.B.C. Young, and G.W. Paul
   4. "Gas hydrate resources of the United States" by T.S. Collett
   5. "Heavy-oil resources of the United States" by Mark Pawlewicz

C. Other
   1. "Annotated bibliography of methodology for assessment of undiscovered oil and gas resources" by R.R. Charpentier, G.L. Dolton, and G.F. Ulmishek
   2. "Development and use of a geographic information system (GIS) for resource appraisal" by W.R. Beeman

DESCRIPTIONS OF PROVINCES AND PLAYS ASSESSED

The author of the province report is the author of all the province text unless otherwise noted. All unconventional plays are listed; frequently they are written by an author who is not the province geologist.

"Introduction to play narratives" by K.L. Varnes

"Region 1 Alaska" by K.J. Bird
"Northern Alaska Province (001)" by K.J. Bird
"Central Alaska Province (002)" by R.G. Stanley
"Kandik Basin" by D.G. Howell

"Southern Alaska Province (003)" by L.B. Magoon, C.M. Molenaar, T.R. Bruns, M.A. Fisher, and Z.C. Valin
"Introduction" by L.B. Magoon
"Alaska Peninsula" by C.M. Molenaar
"Cook Inlet Basin" by L.B. Magoon
"Gulf of Alaska" by T.R. Bruns
"Copper River Basin" by L.B. Magoon and Z.C. Valin
"Southeast Alaska Area" by T.R. Bruns
"Kodiak Islands" by M.A. Fisher

"Region 2 Pacific Coast" by K.J. Bird, L.B. Magoon, and M.E. Tennyson
"Western Oregon-Washington Province (004)" by S.Y. Johnson and M.E. Tennyson
a. Continuous-type unconventional play
0412 "Willamette - Puget Sound Basin-Centered Gas play 0412" by B.E. Law
b. Coal-bed gas plays
0450 "Western Washington - Bellingham Basin play 0450" by S.Y. Johnson and D.D. Rice
0451 "Western Washington - Western Cascade Mountains play 0451" by S.Y. Johnson and D.D. Rice
0452 "Western Washington - Southern Puget Lowlands play 0452" by S.Y. Johnson and D.D. Rice
"Eastern Oregon-Washington Province (005)" by M.E. Tennyson
a. Continuous-type play
0503 "Columbia Basin - Basin-Centered Gas play 0503" by B.E. Law
Klamath - Sierra Nevada Province 6 (Not assessed)
"Northern Coastal Province (007)" by R.G. Stanley
"Sonoma-Livermore Basin Province (008)" by L.B. Magoon
"Sacramento Basin Province (009)" by L.B. Magoon and Z.C. Valin
"San Joaquin Basin Province (010)" by L.A. Beyer
"Central Coastal Province (011)" by R.G. Stanley, with a section on Cuyama Basin by M.E. Tennyson
"Santa Maria Basin Province (012)" by M.E. Tennyson
"Ventura Basin Province (013)" by M.A. Keller
"Los Angeles Basin Province (014)" by L.A. Beyer
a. Continuous-type play
1408 "Deep, Over-Pressured Fractured Rocks of the Central Syncline Play"
"San Diego - Oceanside Province (015)" To be assessed by MMS
"Salton Trough Province (016)" by C.E. Barker

"Region 3- Colorado Plateau and Basin and Range" by J.A. Peterson and J.A. Grow
"Idaho-Snake River Downwarp Province (017)" by J.A. Peterson

"Western Great Basin Province (018)" by C.E. Barker, T.D. Fouch, J.A. Grow, and J.A. Peterson
"Eastern Great Basin Province (019)" by J.A. Peterson and J.A. Grow
"Uinta - Piceance Basin Province (020)" by C.W. Spencer
a. Continuous-type plays
2009 Cretaceous Self-Sourced Fractured Shales Oil
b. Tight-gas plays of the Piceance basin
2007 Tight Gas Piceance Mesaverde Williams Fork play
2010 Tight Gas Piceance Mesaverde Iles
c. "Tight gas plays of the Uinta Basin" by T.D. Fouch and J.W. Schmoker
2015 Tight Gas Uinta Tertiary East
2016 Tight Gas Uinta Tertiary West
2018 Basin Flank Uinta Mesaverde
2020 Deep Synclinal Uinta Mesaverde
d "Coalbed gas plays of the Uinta Basin" by D.D. Rice, T.M. Finn, and W.B. Cashion
2050 Uinta Basin - Book Cliffs
2051 Uinta Basin - Sego
2052 Uinta Basin - Emery
e. "Coalbed gas plays of the Piceance Basin" by R.C. Johnson, D.D. Rice, and T.M. Finn
2053 Piceance Basin - White River Dome
2054 Piceance Basin - Western Basin Margin
2055 Piceance Basin - Grand Hogback
2056 Piceance Basin - Divide Creek Anticline
"Paradox Basin Province (021)" by A.C. Huffman, Jr.
a. Continuous-type play
2103 Fractured Interbed
"San Juan Basin Province (022)" by A.C. Huffman, Jr.
a. Continuous-type plays
2205 Dakota Central Basin Gas
2208 Mancos Fractured Shale
2209 Central Basin Mesaverde Gas
2211 Pictured Cliffs Gas
b. "Coal-bed gas plays" by D.D. Rice and T.M. Finn
2250 San Juan Basin - Overpressured
2252 San Juan Basin - Underpressured Discharge
2253 San Juan Basin - Underpressured
"Albuquerque - Santa Fe Rift Province (023)" by C.M. Molenaar
"Northern Arizona Province (024)" by W.C. Butler
"Southern Arizona - Southwestern New Mexico Province (025)" by W.C. Butler
"South-Central New Mexico Province (026)" by W.C. Butler

"Region 4-Rocky Mountains and Northern Great Plains" by C.W. Spencer
"Montana Thrust Belt Province (027)" by W.J. Perry, Jr.
a. Continuous-type play by W.J. Perry, Jr.
2703 Cone Calcareous Member, Marias River Shale
"North-Central Montana Province (028)" by T.S. Dyman
a. Continuous-type plays
2804 Bakken Shale Fracture Systems
"Northern Great Plains Biogenic Gas plays" by D.D. Rice and C.W. Spencer
2810 Northern Great Plains Biogenic Gas, High Potential
2811 Northern Great Plains Biogenic Gas , Moderate Potential (Suffield Block Analog)
2812 Northern Great Plains Biogenic Gas, Low Potential
"Southwest Montana Province (029)" by W.J. Perry, Jr.
"Williston Basin Province (031)" by J.A. Peterson
a. "Williston Basin Province continuous-type plays" by J.W. Schmoker
3110 Bakken Fairway
3111 Bakken Intermediate
3112 Bakken Outlying
3113 Southern Williston Basin Margin - Niobrara Shallow Biogenic
"Sioux Arch Province (032)" by J.A. Peterson
"Powder River Basin Province (033)" by G.L. Dolton and J.E. Fox
a. Continuous-type plays
3308 Mowry Fractured Shale
3311 Niobrara Fractured Shale
b. "Coalbed gas plays" by D.D. Rice and T.M. Finn
3350 Powder River Basin - Mining-related
3351 Powder River Basin - Central Basin
"Bighorn Basin Province (034)" by J.E. Fox and G.L. Dolton
a. Continuous-type play
3404 Basin-Center Gas
"Wind River Basin Province (035)" by J.E. Fox and G.L. Dolton
a. Continuous-type play
3505 Basin-Center Gas
b. "Coalbed gas play " by R.C. Johnson and D.D. Rice
3550 Wind River Basin - Mesaverde
"Wyoming Thrust Belt Province (036)" by R.B. Powers
"Southwestern Wyoming Province (037)" by B.E. Law
a. Continuous-type plays
3740 Greater Green River Basin - Cloverly-Frontier
3741 Greater Green River Basin - Mesaverde
3742 Greater Green River Basin - Lewis
3743 Greater Green River Basin - Fox Hills-Lance
3744 Greater Green River Basin - Fort Union

b. Coal-bed gas plays
3750 Greater Green River Basin - Rock Springs
3751 Greater Green River Basin - Iles
3752 Greater Green River Basin - Williams Fork
3753 Greater Green River Basin - Almond
3754 Greater Green River Basin - Lance
3755 Greater Green River Basin - Fort Union

"Park Basins Province (038)" by C.J. Wandrey and C.E. Barker
a. Continuous-type play
3803 "Upper Cretaceous Niobrara Fractured Shale Oil play 3803" by R.M. Pollastro

"Denver Basin Province (039)" by D.K. Higley, R.M. Pollastro, and J.L. Clayton
a. Continuous-type plays
3904 Greater Wattenberg Codell/Niobrara Oil and Gas
3906 J Sandstone Deep Gas (Wattenberg)
3911 "Fractured Shale - Pierre (play 3911)" by D.K. Higley and D.L. Gautier
3920 Fractured Niobrara - Greater Silo/Dale Salt-Edge Oil
3921 Fractured Niobrara - Greater Northern Denver Basin Oil

"Las Animas Arch Province (040)" by C.W. Keighin

"Raton Basin - Sierra Grande Uplift Province (041)" by C.W. Keighin
a. "Raton Basin coalbed gas plays" by D.D. Rice and T.M. Finn
4150 Northern Raton Basin
4151 Raton Basin - Purgatoire River
4152 Southern Raton Basin

"Region 5-West Texas and Eastern New Mexico" by M.M. Ball, M.E. Henry, and W.J. Perry, Jr.

"Pedernal Uplift Province (042)" by M.M. Ball and M.E. Henry

"Palo Duro Basin Province (043)" by M.M. Ball and M.E. Henry

"Permian Basin Province (044)" by M.M. Ball

"Bend Arch - Fort Worth Basin Province(045)" by M.M. Ball and W.J. Perry, Jr.
a. Continuous-type play
4503 Mississippian Barnett Shale

"Marathon Thrust Belt Province (046)" by W.J. Perry, Jr., and M.E. Henry

"Region 6-Gulf Coast" by C.J. Schenk

"Western Gulf Province (047)" by C.J. Schenk and R.J. Viger
a. Continuous-type plays
4747 Austin Chalk - Pearsall
4748 Austin Chalk - Giddings
4749 Austin Chalk - Outlying

"East Texas Basin Province (048) and Louisiana-Mississippi Salt Basins Province (049)" by C.J. Schenk and R.J. Viger

a. Continuous-type play
4923 Cotton Valley Blanket Sandstones Gas
"Florida Peninsula Province (050)" by R. M. Pollastro

"Region 7- Midcontinent" by R.R. Charpentier
"Superior Province (051)" by J.G. Palacas
"Iowa Shelf Province (052)" by J.G. Palacas
"Cambridge Arch - Central Kansas Uplift Province (053)" by D.K. Higley
"Salina BasinProvince (054) Sedgwick Basin Province (059)" by S.E. Prensky
"Nemaha Uplift Province (055)" by R.R. Charpentier
"Forest City Basin Province (056)" by R.R. Charpentier
a. Coal-bed gas play
5650 "Forest City Basin - Central Basin play 5650" by D.D. Rice
"Ozark Uplift Province (057)" by J.R. Hatch
"Anadarko Basin Province (058)" by M.E. Henry and T C. Hester
a. "Continuous-type play"
5811 "Woodford/Chattanooga/Arkansas Novaculite of Midcontinent play 5811" by J.W. Schmoker
Prov. 59. (See Prov. 54)
"Cherokee Platform Province (060)" by R.R. Charpentier
a. Coal-bed gas play
6050 "Cherokee Platform - Central Basin play 6050" by D.D. Rice
"Southern Oklahoma Province (061)" by M.E. Henry and T.C. Hester
"Arkoma Basin Province (062)" by W.J. Perry, Jr.
a. "Arkoma Basin Province coal-bed gas plays" by D.D. Rice
6250 Arkoma Basin - Anticline
6251 Arkoma Basin - Syncline

"Region 8-Eastern" by R.T. Ryder
"Michigan Basin Province (063)" by G.L. Dolton
a. Continuous-type plays
6319 Antrim Shale Gas, Developed Area
6320 Antrim Shale Gas, Undeveloped Area
"Illinois Basin Province (064)" by D.L. Macke
a. Continuous-type play
6407 "Illinois Basin-New Albany Shale Gas play 6407" by J.R. Hatch
b. "Illinois Basin Province coal-bed gas play" by D.D. Rice, T.M. Finn, and J.R. Hatch
6450 Illinois Basin - Central Basin
"Black Warrior Basin Province (065)" by R.T. Ryder
a. "Black Warrior Basin Province coal-bed gas plays" by D.D. Rice and T.M. Finn
6550 Black Warrior Basin Recharge

6551 Black Warrior Basin - Southeastern Basin
6552 Black Warrior Basin - Coastal Plain
6553 Black Warrior Basin - Central and Western Basin

"Cincinnati Arch Province (066)" by R.T. Ryder

a. Continuous-type play

6604 "Devonian Black Shale Gas play 6604"by R.T. Ryder and J.R. Hatch

"Appalachian Basin Province (067)" by R.T. Ryder

a. Continuous-type plays Clinton/Medina Gas plays (6728 through 6731)

6728 Clinton/Medina Sandstone Gas High Potential
6729 Clinton/Medina Sandstone Gas Mediuim Potential
6730 Clinton/Medina Sandstone Gas Medium-Low Potential
6731 Clinton/Medina Sandstone Gas Low Potential

Upper Devonian Sandstone Gas plays (6733 through 6736)

6733 Upper Devonian Sandstone Gas High Potential
6734 Upper Devonian Sandstone Gas Medium Potential
6735 Upper Devonian Sandstone Gas Medium-Low Potential
6736 Upper Devonian Sandstone Gas Low Potential

"Devonian Black Shale Gas plays" by R.C. Milici

6740 Devonian Black Shale Gas - Greater Big Sandy
6741 Devonian Black Shale Gas - Greater Siltstone Content
6742 Devonian Black Shale Gas - Lower Thermal Maturity
6743 Devonian Black Shale Gas - Undeveloped Northeastern Ohio and Western Pennsylvania

b. "Coal-bed gas plays" by D.D. Rice and T.M. Finn

6750 Northern Appalachian Basin - Anticline
6751 Northern Appalachian Basin - Syncline
6752 Central Appalachian Basin - Central Basin
6753 Cahaba Coal Field

"Blue Ridge Thrust Belt Province (068), Piedmont Province (069), Atlantic Coastal Plain Province (070), Adirondack Uplift Province (071), and New England Province (072)" by R.C. Milici

NARRATIVE SUMMARIES OF UNCONVENTIONAL PLAYS BY TYPE (These summaries also have been integrated into the reports by Region and Province above.)

A. "Introduction to narratives for continuous-type accumulations" by J.W. Schmoker

B. "Geologic framework and description of coalbed gas plays" by D.D. Rice Introduction

Region 2-Pacific Coast

"Western Washington (part of Province 104)" by S.Y. Johnson and D.D. Rice

plays 0450, 0451, 0452

Region 3-Colorado Plateau and Basin and Range
Uinta-Piceance Basin Province (020)
"Uinta Basin" by D.D. Rice, T.M. Finn, and W.B. Cashion
plays 2050, 2051, 2052
"Piceance Basin" by R.C. Johnson, D.D. Rice, and T.M. Finn
plays 2053 through 2057
"San Juan Basin Province (022)" by D.D.Rice and T.M. Finn
plays 2250, 2252, 2253

Region 4-Rocky Mountains and Northern Great Plains
"Powder River Basin Province (033)" by D.D.Rice and T.M. Finn
plays 3350, 3351
"Wind River Basin Province (035)" by R.C. Johnson and D.D. Rice
play 3550
"Southwestern Wyoming Province (037)" by B.E. Law
plays 3750 through 3755
"Raton Basin Province (041)" by D.D. Rice and T.M. Finn
plays 4150, 4151, and 4152

"Region 7-Midcontinent" by D.D.Rice, T.M. Finn, and J.R. Hatch
Forest City Basin Province (056)
play 5650
Cherokee Platform Province (060)
play 6050
Arkoma Basin Province (062)
Plays 6250, 6251

Region 8-Eastern
"Illinois Basin Province (064)" by D.D. Rice, T.M. Finn, and J.R. Hatch
play 6450
"Black Warrior Basin Province (065)" by D.D. Rice and T.M. Finn
plays 6550 through 6553
"Appalachian Basin Province (067)" by D.D. Rice and T.M. Finn
plays 6750 through 6753